

## EFFECT OF *NIGELLA SATIVA* SILVER NANOPARTICLES ON SOME CARDIAC BIOMARKERS IN HYDROGEN PEROXIDE TREATED RATS - PART II

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**ABSTRACT :** The present study was aimed at studying the effect of *Nigella sativa* selenium nanoparticles (NSSNPS) on cardiac dysfunction induced by  $H_2O_2$  in rats. Green synthesis of (NSSNPS) using an aqueous extract of *Nigella sativa* was performed in this study. Forty (40) adults male rats were randomly and equally splitted into five groups and had been remedying for two months daily as followings: Control (G1): were received tap water,  $H_2O_2$  (G2) group received tap water containing 1% of Hydrogen peroxide ( $H_2O_2$ ), animals in NSSNPs-25 (G3) and NSSNPs-50 (G4) groups were injected intraperitoneally (IP) *Nigella sativa* silver nanoparticles (25 and 50 mg/kg BW respectively) and received ordinary tap water containing 1%  $H_2O_2$  and NS group (G5): animals in this group were injected IP *Nigella sativa* Seed Extract (50 mg/kg BW) and received ordinary tap water containing  $H_2O_2$  1%. At the end of the experiments, blood samples were collected from orbital sinus technique and serum samples were used for estimation of some cardiovascular biomarkers such as lactate dehydrogenase (LD), creatine kinase (CK) activity, cardiac Troponin-I (cTnI) and interleukin-10 (IL-10) concentration. Sections from aorta and cardiac myocyte were taken for histopathological study. The results showed significant elevation of (LD) and (CK) activity and (cTnI) concentration with depression in (IL-10) concentration in  $H_2O_2$  and NSSNPs-50 groups. Such cardiac biomarkers changes were documented with architecture alteration in the aortic and cardiac tissues. The results also confirm the amelioration of previous biochemical markers after IP injection of NS (group G5) and NSSNPs-25 (group G3) by restoration all previous parameters correlated with cardiovascular biomarker (depression of (LD), (CK) activity, (cTnI), and increased (IL-10). Such biochemical changes were accompanied with structural amelioration of pathological lesion in aorta and myocardial cell. On conclusion the result in current study explained the cytotoxic effect of NSSNPs and  $H_2O_2$  at high concentration and documents the ameliorative effect of NS and NSSNPs at low concentration on some cardiac biomarkers.

**Key words :** *Nigella sativa*, silver nanoparticle, cardiac biomarker, rat.

### INTRODUCTIONS

Nanomaterials have been a matter of intense exploration because of their potential applications in diverse consumer products. There are diverse types of nanomaterials had been utilized and incorporated within the household items for example drink and food containers, toys, appliances and dental care products, The a key reason for used is their unique antifungal, antimicrobial, and antibacterial properties (Durón N *et al*, 2016; Al-ogaidi I *et al*, 2017; Saratale R G *et al*, 2017). As such the most important of the metal nanoparticles is silver nanoparticle (AgNP), In addition to its dietary use (Soares T *et al*, 2016). AgNPs might be emitted to the environment through several routes: recycling of waste or goods, incorporation into goods, and manufacturing (Fabrega J *et al*, 2011). AgNPs have unique optical properties, were exploited in medical field

such as medical imaging, therapeutic applications and biosensing (Di Pietro P *et al*, 2016). Utilization of AgNPs in medical products, involving cardiovascular catheters, bone cement and, wound dressings (Ge L *et al*, 2014) has been widely illustrated. Silver nanoparticles have been introduced into many therapeutic uses as anti-platelet, anti-angiogenesis (Rogers G C *et al*, 2008 and Gurnathan S *et al*, 2013) anti-inflammatory (Wong R *et al*, 2009) and antibacterial agent (Alizadeh A *et al*, 2013). Besides, AgNPs could be used for treatment of renal damage in methotrexate exposed rats (Sood M A and Khudiar K K, 2018). Numerous studies on AgNPs that indicate it have ability to stimulate immunological responses and inflammatory events in cells (Luo Y-H *et al*, 2015; Boudreau M D *et al*, 2016 and Garcia T *et al*, 2016). Depending on their surface chemistry and size, the AgNPs may have ability to translocate towards the target